REMARKS

This communication is in response to the non-final Office Action issued January 28, 2005. The Examiner objected to claim 34 as containing an informality. The Examiner rejected claims 13-15, 17-28, and 31-34 under 35 U.S.C. § 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. The Examiner rejected claims 13-15, 17-28, 30, and 32-34 under 35 U.S.C. § 102 in view of U.S. Patent No. 5,023,048 to Mardon *et al.* (Mardon). The Examiner rejected claim 29 under 35 U.S.C. § 103 in view of Mardon modified by U.S. Patent No. 5,211,774 Garde *et al.* (Garde '774).

Claim Objections

In section 2 of the Office Action, the Examiner objected to claim 34 as containing an informality. The claim has been canceled above, obviating the objection.

Claim Rejections Under 35 U.S.C. § 112, First Paragraph

In sections 3-4 of the Office Action, the Examiner rejected claims 13-15, 17-28, and 31-34 under 35 U.S.C. § 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Specifically, the Examiner cited the O and Si ranges.

The Applicants respectfully traverse the Examiner's rejections. The Examiner's attention is kindly directed to page 9 of the written description. The presence of impurities such as O and Si is discussed beginning at line 15. While the alloy of the invention preferably "comprises no essential amount of other materials" than those previously mentioned in the written description,

"small amounts of impurities may exist in the alloy." Si and O are specifically mentioned. It is thus completely clear from the original application that small amounts of Si and O may exist. Expected ranges for O and Si are provided at the bottom of page 9 - "Si and O may exist in contents where Si is 5-120 ppm and O is 500-1600 ppm." The upper limits 120 ppm and 1600 ppm are thus clearly disclosed. This fact together with the mentioned disclosure that small amounts of Si and O may exist in the alloy would undoubtedly be understood by a person skilled in the art such that the alloy may include "up to 1600 ppm O" and "up to 120 ppm Si." Thus, these recitations are supported by the application as filed.

The Applicants further traverse the rejections of claims 31-34. While these claims have been canceled above, obviating the rejections, the Applicants feel discussion of their support is warranted. In the originally filed claim 1 it is specified that the alloy may contain normal contents of impurities. Furthermore, on page 9 of the written description it is specified that the alloy may contain small amounts of impurities. On page 9 it is also specified that a small amount of O or a small amount of Si may exist in the alloy. It is clear to a person skilled in the art that the production of the alloy will normally result in some impurities. To a person skilled in the art, it is therefore clear from the originally filed application that the alloy may contain (*i.e.*, that there "may exist") an amount of O or an amount of Si that is only at a level which is the normal impurity level that results from the production of the alloy. Consequently, each of claims 31 and 32 is supported by the application as filed.

On page 7 it is specified that the alloy may contain 0-0.6 weight % Cr or may contain 0-0.2 weight % Ni. The figure "0" in these ranges makes clear that the alloy may contain no Cr or no Ni. However, a small amount of Cr or Ni at the impurity level may still be unavoidable. This is clear from, for example, the originally filed claim 1, where it is specified that in addition to the

listed amounts of Nb, Fe, and Sn, the alloy may contain normal contents of impurities. Consequently, it is, from the originally filed application, clear to a person skilled in the art that the alloy may comprise no Cr or no Ni except for possibly a very small amount of Cr or Ni at the impurity level. Consequently, each of claims 33 and 34 is supported by the application as filed.

In view of the foregoing, the Examiner's rejections under 35 U.S.C. § 112, first paragraph, of the claims are believed to be overcome.

Claim Rejections Under 35 U.S.C. § 102

In sections 5-6 of the Office Action, the Examiner rejected claims 13-15, 17-28, 30, and 32-34 under 35 U.S.C. § 102 in view of Mardon.

It is well settled that for a rejection of a claim under 35 U.S.C. § 102 to be proper, each and every element as set forth in the claim must be found in a single reference. See, for example, MPEP § 2131. For at least the reasons stated below, the Examiner's rejections of the claims do not satisfy this burden.

The claims have been amended above to recite a cladding tube for nuclear fuel. This amendment is supported by several parts of the original application, in particular by the originally filed claim 10. Furthermore, on page 6 lines 28-29 it is stated that the component defines a cladding tube. On page 7 lines 22-23 it is specified that the component is a cladding tube. The cladding tube may however, as an option, be provided with an inner protective layer. This fact is clear from, for example, page 6 line 33 to page 7 line 9, page 9 lines 4-13, and original claims 11 and 12. Such an optional inner protective layer is, as a person skilled in the art knows, often called a liner. A person skilled in the art also knows that such a protective liner is thin compared to the thickness of the alloy that constitutes the actual base material of the tube. This is also clear from the purpose, described in the specification, of this layer. Moreover, also

from a linguistic point of view a protective layer could not reasonably be thicker than the component to which it is applied, since if this were the case, then it would not be called an inner protective layer; instead this "layer" would be the main component.

Mardon appears to disclose a so-called duplex tube. Such a duplex tube comprises a main tubular element provided with an outer surface layer. It is clear already from the abstract that this layer only constitutes 10-25% of the total thickness of the wall. The concept "duplex tube" is also explained in, for example, column 1 lines 49-62. Mardon thus suggests a particular duplex tube. The main portion of this tube is made of a zirconium alloy of conventional type (see, for example, column 2 lines 55-68). These conventional alloys are very different from the alloy according to present invention. Consequently, Mardon does not teach the present invention. In particular, since it is clear, as explained above, that according to the present invention it is the main part of (or the whole) tubular element that is actually formed by the novel alloy defined in the independent claims. For this reason alone it is clear that the present invention is new and inventive and patentable over Mardon.

Mardon appears to disclose, as mentioned above, a thin outer protective layer. Mardon does not teach that this thin outer layer should constitute the base material for the tubular element. On the contrary, as explained above, this layer is only used as an external protective layer. Furthermore, the composition of the alloy in this protective layer is given in examples 1-3 in column 3. Example 1 defines an Fe range that does not at all overlap with the Fe range of the alloy of present invention. Example 3 includes V, and is therefore not in accordance with the alloy of the present invention. Example 2 includes an Fe content that is within the range defined in the present independent claims. However, example 2 teaches a lower Sn content, that only coincides with the range defined in the present independent claims at the exact value 0.65.

Furthermore, example 2 in the cited document teaches a Nb content that is essentially lower than according to the present invention. The Nb content only coincides with the range defined in the present independent claims at the exact value 0.65. Furthermore, Mardon example 2 only mentions ranges for each of the elements of the alloy; it does not teach any concrete example of how to choose the exact amounts of the different elements. A person skilled in the art, who would like to fabricate the tubular element according to Mardon, has, by necessity, to choose some particular values for the different alloying elements. There is no indication in Mardon that a person skilled in the art would choose exactly the upper limit (0.65) for Sn and at the same time select the very highest upper limit for the Nb content (0.65). This means that Mardon does not suggest the alloy defined in the independent claims of the present application. On the contrary, even the alloy according to Mardon example 2 teaches away from the alloy defined in the present independent claims, since Mardon teaches a lower range for the Sn content and a lower range for the Nb content. Mardon therefore does not suggest an alloy according to the present invention even in connection with the outer protective layer described therein. Moreover, Mardon does not even suggest such an alloy for the main portion of the tubular element.

From the declarations supplied by Mr. Magnus Limbäck, it is clear that the alloy according to the present invention has surprising new advantageous properties. This is clear already from the previous declaration already of record, but in particular from the new declaration submitted herewith as Exhibit A that includes further information. In particular from the additional experiments that are explained in connection with figure C, the advantageous properties of the alloy according to the present invention are clear. Furthermore, the inventors of the present invention have found that an alloy according to the present invention has such properties concerning for example strength and creep, that the alloy is very suitable to use for the

whole cladding tube, or at least for the main part of such a tubular element. Since, as is clear from the declarations, the alloy also has very advantageous properties concerning corrosion resistance, it is not necessary to provide such a cladding tube with any outer protective duplex layer. Consequently, it is clear that the inventors of the present invention have provided an important step forward in the design of suitable cladding tubes to be used in nuclear reactors. In this technical field it is moreover very important to provide materials with good properties such that the cladding tubes can be used during a long time without risking being degraded.

In view of the foregoing, the Examiner's rejections under 35 U.S.C. § 102 to the claims are believed to be overcome.

Claim Rejections Under 35 U.S.C. § 103

In sections 7-8 of the Office Action, the Examiner rejected claim 29 under 35 U.S.C. § 103 in view of Mardon modified by Garde.

Claim 29 has been canceled above, obviating the Examiner's rejection. In view of the foregoing, the Examiner's rejections under 35 U.S.C. § 103 to the claims are believed to be overcome.

Other Cited Art

The Examiner cited U.S. Patent No. 5,790,623 to Van Swam in order to show conventional inner layers. However, the alloys disclosed in this reference are not similar to the alloy defined in the present independent claims. Consequently, this cited reference would not lead a person skilled in the art to the present invention.

The Examiner also cited U.S. Patent No. 5,254,308 to Garde *et al.* However, this reference does not suggest an alloy in accordance with the present independent claims. In

particular, this reference defines a lower Nb content than the present invention. Furthermore, this document suggests 0.2-0.3% Cr.

The Examiner also cited Garde '774. This reference discloses that an alloy can contain a certain amount of Si. However, this reference discloses another kind of alloy than the alloy defined in the present independent claims. The alloy according to this reference includes Cr. Furthermore, the reference discloses a lower Nb content than the present invention.

Since, as explained above, Mardon does not suggest the present invention, neither does the combination of this reference with any of the other cited documents (which, as just explained, does not point towards the present invention).

Additional Fees

The Commissioner is hereby authorized to charge any insufficiency, including a $120 one-month extension for response fee, or credit any overpayment associated with this application to Swidler Berlin LLP Deposit Account No. 19-5127 (order no. 19378.0011). This Response is timely filed with a one-month extension due to May 28, 2005 being a Saturday and Monday May 30, 2005 being a Federal Holiday within the District of Columbia.

Conclusion

Claims 13, 22, and 23 have been amended, claims 14, 15, 17-21, and 24-34 have been canceled, and claims 35-40 have been added. Claims 13, 22, 23, and 35-40 are pending in the application, and are believed to be in condition for allowance. In view of the foregoing, all of the Examiner's rejections of the claims are believed to be overcome. The Applicants respectfully request reconsideration and issuance of a Notice of Allowance for all claims.

Should the Examiner feel further communication would help prosecution, the Examiner is urged to call the undersigned at the telephone number provided below.

Respectfully Submitted,

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